IN THE CLAIMS:

1. (original) Rate and quality control system for an AVC-based video coder, comprising:

a picture analyzer, to generate complexity indicators from each picture of an input video sequence;

a first quantizer estimator to generate a first quantizer estimate for each picture based on the complexity indicators, a target coding rate calculated for each picture and a buffer fullness indicator representing a quantity of stored previously-coded video data;

a second quantizer estimator, to generate a second quantizer estimate for each picture, the second quantizer estimates for I and P pictures based on a linear regression analysis of quantizers and coding rates of previously-coded pictures; and

a quantizer selector to generate a quantizer parameter for each picture from the first and second quantizer estimates.

2. (original) The rate and quality control system of claim 1 , wherein the AVC video coder comprises:

an integer approximated transform circuit, to generate transform coefficients from input pixel data based on the input pictures,

a forward quantizer to divide the transform coefficients according to the quantizer parameter,

a transform scaler, coupled to the forward quantizer,

a forward scan unit, coupled to the transform scaler,

a variable length coder, coupled to the forward scan unit, and

a formatter, coupled to the variable length coder.

3. (original) The rate and quality control system of claim 2, further comprising

a coding policy unit, to determine when it becomes necessary to eliminate non-zero quantized transform coefficients according to a rate control policy, and

wherein the AVC coder further comprises a coefficient zeroer provided between the forward quantizer and the transform scaler, responsive to control from the coding policy unit, to eliminate selected quantized transform coefficients.

4. (original) The rate and quality control system of claim 2, further comprising

a coding policy unit, to determine when it becomes necessary to eliminate pictures from the video sequence from being coded according to a rate control policy, and

a video preprocessing unit, responsive to control from the coding policy unit, to perform frame decimation before pictures are input to the AVC coder.

5. (original) The rate and quality control system of claim 2, further comprising

a coding policy unit, to determine when it becomes necessary to eliminate motion vectors according to a rate control policy, and

wherein the AVC coder includes a prediction circuit that generates motion vectors for prediction of video data of macroblocks in the input pictures and of video data for sub-blocks therein of various sizes, the prediction circuit responsive to control from the coding policy unit, to eliminate selected motion vectors from an output coded bitstream.

6. (original) The rate and quality control system of claim 2, wherein

the AVC coder includes a prediction chain that decodes coded video output from the forward scan unit, the prediction chain including a deblocking filter, and

the rate and quality control system further comprises a coding policy unit, to control the deblocking filter according to a rate control policy.

7. (original) The rate and quality control system of claim 6, wherein the coding policy unit calculates alpha and beta control parameters to be used by an H.264 deblocking filter.

8. (original) The rate and quality control system of claim 2, further comprising

a coding policy unit operative according to a rate control policy, and

wherein the AVC coder includes a prediction chain, comprising:

a spatial predictor that predicts video data for a block of input data according to intra prediction techniques,

a temporal predictor that predicts video data for the block of input data according to temporal predictions between a current picture and one or more previously coded reference frames, and

a mode selector that selects an output from one of the spatial predictor or the temporal predictor for each block of input data,

wherein the mode selector performs its selection based on mode decision control signals from the coding policy unit.

9. (original) The rate and quality control system of claim 1, wherein the complexity indicator includes an indicator of spatial complexity within the picture.

10. (original) The rate and quality control system of claim 1, wherein the complexity indicator includes an indicator of motion complexity of the picture with respect to previously coded pictures.

11. (original) The rate and quality control system of claim 1, wherein the complexity indicator includes an indicator of a number of bits used to represent each pixel in the picture.

12. (original) Rate and quality control system for an AVC-based video coder, comprising:

a content characteristics and coding rate analyzer, responsive to pictures from an input video sequence, to generate complexity indicators representative thereof,

a target bits computer, responsive to the complexity indicators and to a picture type signal, to calculate a target coding rate for each picture in the video sequence,

an buffer based quantizer computer, responsive to the target coding rates, to a buffer indicator signal and to the picture type signal, to generate a buffer-based quantizer estimate for each picture, and

an activity based quantizer computer to calculate activity of each picture in the video sequence and modify the buffer-based quantizer estimate in response thereto,

an AVC coder including a forward quantizer operative according to the modified buffer-based quantizer estimate.

13. (original) The rate and quality control system of claim 12, wherein the complexity indicator includes an indicator of spatial complexity within the picture.

14. (original) The rate and quality control system of claim 12, wherein the complexity indicator includes an indicator of motion complexity of the picture with respect to previously coded pictures.

15. (original) The rate and quality control system of claim 12, wherein the complexity indicator includes an indicator of a number of bits used to represent each pixel in the picture.

16. (original) The rate and quality control system of claim 12, wherein the AVC coder comprises:

an integer approximated transform circuit, to generate transform coefficients from input pixel data,

the forward quantizer to divide the transform coefficients according to the modified buffer-based quantizer estimate,

a transform scaler, coupled to the forward quantizer,

a forward scan unit, coupled to the transform scaler,

a variable length coder, coupled to the forward scan unit, and

a formatter, coupled to the variable length coder.

17. (original) The rate and quality control system of claim 16, further comprising

a coding policy unit, to determine when it becomes necessary to eliminate non-zero quantized transform coefficients according to a rate control policy, and

wherein the AVC coder further comprises a coefficient zeroer provided between the forward quantizer and the transform scaler, responsive to control from the coding policy unit, to eliminate selected quantized transform coefficients.

18. (original) The rate and quality control system of claim 16, further comprising

a coding policy unit, to determine when it becomes necessary to eliminate pictures from the video sequence from being coded according to a rate control policy, and

a video preprocessing unit, responsive to control from the coding policy unit, to perform frame decimation before pictures are input to the AVC coder.

19. (original) The rate and quality control system of claim 16, further comprising

a coding policy unit, to determine when it becomes necessary to eliminate motion vectors according to a rate control policy, and

wherein the AVC coder includes a prediction circuit that generates motion vectors for prediction of video data of macroblocks in the input pictures and of video data for sub-blocks

therein of various sizes, the prediction circuit responsive to control from the coding policy unit, to eliminate selected motion vectors from an output coded bitstream.

20. (original) The rate and quality control system of claim 16, wherein

the AVC coder includes a prediction chain that decodes coded video output from the forward scan unit, the prediction chain including a deblocking filter, and

the rate and quality control system further comprises a coding policy unit, to control the deblocking filter according to a rate control policy.

21. (original) The rate and quality control system of claim 20, wherein the coding policy unit calculates alpha and beta control parameters to be used by an H.264 deblocking filter.

22. (original) The rate and quality control system of claim 16, further comprising

a coding policy unit operative according to a rate control policy, and

wherein the AVC coder includes a prediction chain, comprising:

a spatial predictor that predicts video data for a block of input data according to intra prediction techniques,

a temporal predictor that predicts video data for the block of input data according to temporal predictions between a current picture and one or more previously coded reference frames, and

a mode selector that selects an output from one of the spatial predictor or the temporal predictor for each block of input data,

wherein the mode selector performs its selection based on mode decision control signals from the coding policy unit.

23. (original) Rate and quality control system for an AVC-based video coder, comprising:

a content characteristics and coding rate analyzer, responsive to pictures from an input video sequence, to generate complexity indicators representative thereof,

a rate model quantizer estimator, responsive to quantizers and coding rates of previously-coded pictures and to picture type indicators of input pictures, to estimate quantizer parameters of the input pictures according to a linear regression analysis, wherein linear regression coefficients of input I pictures are selected according to the complexity indicators for such I pictures,

an AVC coder including a forward quantizer operative according to the quantizer estimates.

24. (original) The rate and quality control system of claim 23, wherein the complexity indicator includes an indicator of spatial complexity within the picture.

25. (original) The rate and quality control system of claim 23, wherein the complexity indicator includes an indicator of motion complexity of the picture with respect to previously coded pictures.

26. (original) The rate and quality control system of claim 23, wherein the complexity indicator includes an indicator of a number of bits used to represent each pixel in the picture.

27. (original) The rate and quality control system of claim 23, wherein the AVC coder comprises:

an integer approximated transform circuit, to generate transform coefficients from input pixel data,

the forward quantizer to divide the transform coefficients according to the modified buffer-based quantizer estimate,

a transform scaler, coupled to the forward quantizer,

a forward scan unit, coupled to the transform scaler,

a variable length coder, coupled to the forward scan unit, and

a formatter, coupled to the variable length coder.

28. (original) The rate and quality control system of claim 27, further comprising

a coding policy unit, to determine when it becomes necessary to eliminate non-zero quantized transform coefficients according to a rate control policy, and

wherein the AVC coder further comprises a coefficient zeroer provided between the forward quantizer and the transform scaler, responsive to control from the coding policy unit, to eliminate selected quantized transform coefficients.

29. (original) The rate and quality control system of claim 27, further comprising

a coding policy unit, to determine when it becomes necessary to eliminate pictures from the video sequence from being coded according to a rate control policy, and

a video preprocessing unit, responsive to control from the coding policy unit, to perform frame decimation before pictures are input to the AVC coder.

30. (original) The rate and quality control system of claim 27, further comprising

a coding policy unit, to determine when it becomes necessary to eliminate motion vectors according to a rate control policy, and

wherein the AVC coder includes a prediction circuit that generates motion vectors for prediction of video data of macroblocks in the input pictures and of video data for sub-blocks therein of various sizes, the prediction circuit responsive to control from the coding policy unit, to eliminate selected motion vectors from an output coded bitstream.

31. (original) The rate and quality control system of claim 27, wherein

the AVC coder includes a prediction chain that decodes coded video output from the forward scan unit, the prediction chain including a deblocking filter, and

the rate and quality control system further comprises a coding policy unit, to control the deblocking filter according to a rate control policy.

32. (original) The rate and quality control system of claim 31, wherein the coding policy unit calculates alpha and beta control parameters to be used by an H.264 deblocking filter.

33. (original) The rate and quality control system of claim 27, further comprising

a coding policy unit operative according to a rate control policy, and

wherein the AVC coder includes a prediction chain, comprising:

a spatial predictor that predicts video data for a block of input data according to intra prediction techniques,

a temporal predictor that predicts video data for the block of input data according to temporal predictions between a current picture and one or more previously coded reference frames, and

a mode selector that selects an output from one of the spatial predictor or the temporal predictor for each block of input data,

wherein the mode selector performs its selection based on mode decision control signals from the coding policy unit.

34. (original) A video coding system, comprising:

a rate controller having an input coupled to a source of video data and generating a quantizer selection on a picture-by-picture basis,

a video predicition chain to generate predicted video data on a block-by-block basis,

a block-based video coding chain including:

a subtractor coupled to the source video data and to the video prediction chain,

a transform circuit, to receive data output from the subtractor, and

a quantizer to receive data output from the transform circuit, the quantizer operative according to a quantizer parameter output from the rate controller.

35. (original) The video coding system of claim 34, wherein the video coding chain further deletes transform coefficients under control of the rate controller.

36. (original) The video coding system of claim 34, wherein the video coding chain further deletes motion vectors under control of the rate controller.

37. (original) The video coding system of claim 34, wherein the video prediction chain comprises a deblocking filter whose mode of operation is controlled by the rate controller.

38. (original) The video coding system of claim 34, wherein video prediction chain comprises a prediction mode decision unit whose mode of operation is controlled by the rate controller.

39. (original) The video coding system of claim 34, further comprising a video preprocessor that performs picture decimation under control of the rate controller.

40. (new) A method of controlling the rate and quality for an AVC-based video coder, comprising:

generating complexity indicators from each picture of an input video sequence;

generating a first quantizer estimate for each picture based on the complexity indicators, a target coding rate calculated for each picture and a buffer fullness indicator representing a quantity of stored previously-coded video data;

generating a second quantizer estimate for each picture, the second quantizer estimates for I and P pictures based on a linear regression analysis of quantizers and coding rates of previously-coded pictures; and

generating a quantizer parameter for each picture from the first and second quantizer estimates.

41. (new) The method of claim 40, further comprising:

determining when it becomes necessary to eliminate non-zero quantized transform coefficients according to a rate control policy, and

eliminating selected quantized transform coefficients.

42. (new) The method of claim 40, further comprising:

determining when it becomes necessary to eliminate pictures from the video sequence from being coded according to a rate control policy, and

performing frame decimation before pictures are coded.

43. (new) The method of claim 40, further comprising:

generating motion vectors for prediction of video data of macroblocks in the input pictures and of video data for sub-blocks therein of various sizes,

determining when it becomes necessary to eliminate motion vectors according to a rate control policy, and

eliminating selected motion vectors from an output coded bitstream.